

Craiginmoddie Wind Farm

Environmental Impact Assessment Report Chapter 11: Traffic and Transportation

December 2020

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11 TRAFFIC AND TRANSPORTATION

Introduction

- 11.1 This chapter of the EIA Report (EIA) assesses the likely significant environmental effects of the Proposed Development with respect to Traffic and Transportation. This chapter provides information about the proposed transport arrangements associated with the construction phases of the Proposed Development.
- 11.2 The chapter should be read in conjunction with the project description provided in Chapter 3 and with respect to relevant parts of Chapter 10 Noise, where common receptors have been considered and where there is an overlap or relationship between the assessment of effects.
- 11.3 This chapter is supported by Appendix 11.1: Systra: Abnormal Loads Access Assessment Report (2020).

Legislation, Policy Context and Technical Guidance

Legislative Context

- 11.4 There is no specific legislation that needs to be considered when determining the scope of this assessment.

Planning Policy Context

- 11.5 A summary of transport-specific national, regional and local policies and plans is provided in Table 11.1. These policies and plans have been considered to help define the scope of the assessment.

Table 11.1 Planning policy issues relevant to Traffic and Transportation

Policy Document	Summary of Policy
Scotland's Third National Planning Framework (NPF3)	NPF3 is the spatial expression of The Government Economic Strategy, and of plans for infrastructure investment. It is about the ambition to create great places that support sustainable economic growth across the country.
Scottish Planning Policy (SPP) June 2014	The purpose of the SPP is to set out national planning policies which reflect Scottish Ministers' priorities for operation of the planning system and for the development and use of land.
The Scottish Energy Strategy: The Future of Energy in Scotland (2017)	The Strategy sets out the Scottish Government's vision for the future national energy system to 2050. It describes the priorities for an integrated approach that considers both the use and supply of energy for heat, power and transport.
Transport Scotland Transport Assessment Guidance (2012)	The document aims to assist in the preparation of Transport Assessments for development proposals in Scotland such that the likely transport impacts can be identified and dealt with as early as possible in the planning process. The document sets out

Policy Document	Summary of Policy
	requirements according to the scale of development being proposed. The document notes that a Transport Assessment will be required where a development is likely to have significant transport impacts but that the specific scope and contents of a Transport Assessment will vary for developments, depending on location, scale and type of development.
Onshore Wind Policy Statement (2017)	The Statement was published alongside the draft Energy Strategy. The Statement continues the Scottish Government's existing onshore wind policy set out in previous publications, highlighting the benefits on onshore wind including low costs technology, opportunities associated with island projects, and supply chain.
South Ayrshire Council (SAC) Local Transport Strategy (LTS) (March 2009)	The vision of the LTS to provide high quality integrated local transport system to residents, businesses and visitors. Following are the key objectives: • Encourage modal shift to walking and cycling; • Prioritise the protection of human health and natural environment; • Reduction in road accidents; • Better integrated transport and land-use planning in order to promote economic vitality and inform the Development Plan process; and • Improve cycling and walking network. LTS recognises the Port of Ayr as a gateway location. This is a key port in the area to transport wind farm equipment and other materials. Improvement of road network in the vicinity of the port of Ayr is one of the key actions in the LTS. LTS also recognises that road freight is vital to support local industries, water freights and rail freights.
South Ayrshire Local Development Plan (LDP) (September 2014)	The key aim of the LDP is to strike a balance between growing economy and protecting important environmental assets. LDP policy "Land and Transport" states that development proposal should take appropriate measures to keep any negative effects of road traffic on the environment to a minimum. LDP policy "Strategic Road Development" states that SAC will support those developments that do not adversely affect the efficiency and safety of the relevant sections of the network. It also emphasises that development should ensure that, where required, the necessary improvements to the A77 throughout South Ayrshire are carried out to support development in compliance with the LDP. LDP policy "Freight Transport" states that SAC will support those developments that ensure the movement of freight by road in a way that disrupts local communications as little as possible and reduces the use of inappropriate public roads. It encourages the transport of freight in ways other than by road, where possible and also encourages to use the preferred HGV routes. LDP policy "Outdoor Public Access and Core Paths" emphasises that a suitable measure should be provided for all affected core paths.
South Ayrshire Modified Proposed Local	This document is under consultation and review process. However, all transport related policies mentioned above are unchanged in MPLDP2.

Policy Document	Summary of Policy
Development Plan 2 (MPLDP2) (July 2020)	

Technical guidance

- 11.6 The assessment has been conducted with reference to guidance contained in *Guidance Notes No.1: Guidelines for the Environmental Assessment of Road Traffic (GEART)* (Institute of Environmental Assessment, 1993).
- 11.7 The Timber Transport Forum 'Voluntary Agreed Maps' have been used to inform the construction route options for HGV traffic. Routes have been developed by the timber transport groups at local authority level and categorise roads leading to forest areas in terms of their capacity the likely level of timber haulage.

Stakeholder Consultation

- 11.8 Pre-application engagement has taken place between South Ayrshire Council (SAC) and Transport Scotland (TS) in the form of a 'Scoping Request'. A summary of the 'Scoping Opinion' is provided in Table 11.2.

Table 11.2 Consultation Summary

Consultee	Summary of Response	Comment/Action Taken
Transport Scotland	We note that the access route to the site is identified as being the A77(T) and then onto the B7023. As the trunk road forms part of the route to site, Transport Scotland will require potential trunk road related environmental impacts such as driver delay, pedestrian amenity, severance, safety etc to be considered and assessed where appropriate (i.e. where IEMA Guidelines for further assessment are breached).	Consideration of the proposed haulage routes is outlined in Section 11.35. An assessment for effects in accordance with the IEMA guidelines is provided in Section 11.64 onwards.
Transport Scotland (TS)	Transport Scotland will require to be satisfied that the size of turbines and blades proposed can negotiate the selected route and that their transportation will not have any detrimental effect on structures within the trunk road route path.	Consideration of abnormal load movements is provided in Appendix 11.1
Transport Scotland (TS)	Swept path analysis should be undertaken and details provided with regard to any required changes to street furniture or structures along the route. We would also state that any proposed changes to the trunk road network must be discussed and approved (via a technical approval process) by the appropriate Area Manager prior to the movement of any abnormal load.	Swept Path Analysis is provided in Appendix 11.1. Specific details of proposed changes to the trunk road network would be addressed as part of a planning

Consultee	Summary of Response	Comment/Action Taken
		condition and prior to construction.

Assessment Methodology & Significance Criteria

Methodology for the Prediction of Effects

11.9 The project description is set out in Chapter 3 of this EIAR. Whilst this has informed the approach that has been used in this Traffic and Transportation assessment, it is necessary to set out how this methodology has been applied, and adapted as appropriate, to address the specific needs of this Traffic and Transport assessment.

11.10 The guidance that is followed when assessing the potential significance of road traffic effects is summarised in GEART (IEA, 1993), which states that:

"The detailed assessment of impacts is...likely to concentrate on the period during which the absolute level of an impact is at its peak, as well as the hour at which the greatest level of change is likely to occur." (Paragraph 3.10).

11.11 To assess the impact at its peak, the likely percentage increase in traffic is determined by comparing estimates of traffic generated by the Proposed Development with future predicted baseline traffic flows (in 2024 – anticipated year of construction) on the road links in the vicinity of the Site.

11.12 GEART provides two rules that are used to establish whether an environmental assessment of traffic effects should be carried out on receptors:

- Rule 1: Include highway links where traffic flows are predicted to increase by more than 30% (or where the number of HGVs is predicted to increase by more than 30%); and
- Rule 2: Include sensitive areas where traffic flows are predicted to increase by 10% or more.

11.13 It should be noted that, according to GEART, predicted traffic flow increases below 10% are generally not considered to be significant as daily variations in background traffic flow may fluctuate by this amount. Changes in traffic flows below this level are, therefore, assumed not to result in significant environmental effects and have therefore not been assessed further as part of this study.

Receptor Sensitivity

11.14 The sensitivity of each highway link included in the assessment has been assigned a sensitivity in accordance with GEART. This is based on the proximity of sensitive receptors to the highway link and the highway environment. Table 11.3 summarises the rationale used to determine the sensitivity against the corresponding receptors as part of the assessment as contained in GEART. Professional judgement is also used to determine the sensitivity of the receptor.

Table 11.3 Sources of information used for the Traffic and Transport assessment

Sensitivity	Description / reason	Receptor
High	Receptors of greatest sensitivity to traffic flows: schools, colleges, playgrounds, accident blackspots, retirement homes and urban/residential homes without footways that are used by pedestrians and cyclists.	Residents/workers travelling to and from work or home on foot and by bicycle, school children, leisure walkers and equestrians.
Medium	Traffic flow sensitive receptors including: congested junctions, doctors' surgeries, hospitals, shopping areas with roadside frontage, roads with narrow footways, unsegregated cycle ways, community centres, parks, recreation facilities.	Residents/workers travelling to and from work or home on foot and by bicycle, people visiting these land uses.
Low	Receptors with some sensitivity to traffic flows: places of worship, public open space, nature conservation areas, listed buildings, tourist/visitor attractions and residential areas with adequate footway provision.	Residents/workers travelling to and from work or home on foot or bicycle and people visiting these land uses.
Negligible	Receptors with low sensitivity to traffic flows: Motorway and Dual Carriageways and/or land uses sufficiently distant from affected routes and junctions.	Residents/workers travelling by foot or by bicycle.

- 11.15 Sensitivity judged as High or Medium results in Rule 2 (sensitive areas where traffic flows are predicted to increase by 10% or more) being considered for that highway link. Sensitivity judged as Low or Negligible results in Rule 1 being considered for that highway link (where traffic flows are predicted to increase by more than 30% (or where the number of HGVs is predicted to increase by more than 30%)).

Magnitude of Change

- 11.16 Table 11.4 provides a summary of the magnitude of change for each transport effect, with the thresholds used to determine this being based on guidance within GEART.

Table 11.4 Magnitude of Change Summary

Magnitude of Change				
Transport Effect	Substantial	Moderate	Slight	Negligible
Severance	Change in total traffic or HGV flows over 91%	Change in total traffic or HGV flows of 61-90%	Change in total traffic or HGV flows of 31-60%	Change in total traffic or HGV flows of less than 30%
Driver Delay	Change in total traffic or HGV flows over 91%	Change in total traffic or HGV flows of 61-90%	Change in total traffic or HGV flows of 31-60%	Change in total traffic or HGV flows of less than 30%

Pedestrian Amenity and Delay	Change in total traffic or HGV flows over 91%	Change in total traffic or HGV flows of 61-90%	Change in total traffic or HGV flows of 31-60%	Change in total traffic or HGV flows of less than 30%
Accident and Safety	Informed by a review of existing collision patterns and trends based upon the existing personal injury accident records and the forecast increase in traffic.			

Significance Criteria

- 11.17 The classification of a likely traffic and transport effect is derived by considering the sensitivity of the receptor (derived from Table 11.3) against the magnitude of change (derived from Table 11.4) as defined in Table 11.5 below. The shading indicates those significance ratings that are deemed to be 'significant' effects.

Table 11.5 Significance Criteria

Magnitude of Change					
Sensitivity		Substantial	Moderate	Slight	Negligible
	High	Major	Major / Moderate	Moderate	Minor / Negligible
	Medium	Major / Moderate	Moderate	Minor	Negligible
	Low	Moderate	Minor	Minor	Negligible
	Negligible	Minor / Negligible	Negligible	Negligible	Negligible

- 11.18 Major, Major/Moderate and Moderate effects and are considered to be significant in terms of the EIA guideline, whilst Minor, Minor/Negligible and Negligible effects are considered neutral/not significant.

Methodology for the Prediction of Effects

GEART Criteria

- 11.19 In relation to traffic and transport, the significance of each effect identified in Table 11.4 has been considered against the criteria within GEART, where possible. However, GEART states that:

'For many effects there are no simple rules or formulae which define thresholds of significance and there is, therefore, a need for interpretation and judgement on the part of the assessor, backed-up by data or quantified information wherever possible. Such judgements will include the assessment of the numbers of people experiencing a change in environmental impact as well as the assessment of the damage to various natural resources.' (Paragraph 4.5, IEA, 1993).

Severance

- 11.20 There are no predictive formulae which give simple relationships between traffic factors and levels of severance. GEART states that changes in traffic flow of 30%, 60% and 90% are regarded as producing 'slight', 'moderate' and 'substantial' changes in severance. In general, marginal (slight) changes in traffic flow are, by themselves, unlikely to create or remove severance.

Driver Delay

- 11.21 GEART states that delays are only likely to be significant when the traffic on the network surrounding the development is already at, or close to, the capacity of the system. The capacity of a road or a particular junction can be determined by establishing the ratio of flow to capacity (RFC).
- 11.22 For this assessment, criteria from GEART has been used to assess the effects on traffic levels and driver delay, which states the need for assessment where changes in traffic flows exceed 30%.

Pedestrian Delay

- 11.23 Given the range of local factors and conditions which can influence pedestrian delay, GEART does not recommend that thresholds be used as a means to establish the significance of pedestrian delay but recommend that reasoned judgements be made instead. However, GEART suggests a lower threshold of 10 seconds delay and upper threshold of 40 seconds delay which, for a link with no crossing facilities, equates to the lower threshold of a two-way flow of 1,400 vehicles per hour. For this assessment, the significance of the effects of construction traffic on pedestrian delay would be based on professional judgement and interpretation.

Pedestrian Amenity

- 11.24 GEART notes that changes in pedestrian amenity may be considered significant where the traffic flow is halved or doubled, with the former leading to a positive effect and the latter a negative effect.

Fear and Intimidation

- 11.25 There are no commonly agreed thresholds by which to determine the significance of this effect. GEART notes that special consideration should be given to areas where there are likely to be particular problems, such as high-speed sections of road, locations of turning points and accesses. Consideration should also be given to areas frequented by school children, the elderly and other vulnerable groups.

Accidents and Safety

- 11.26 This is informed by a review of existing collision patterns and trends based upon the existing personal injury collision records and the forecast increase in traffic.

- 11.27 For this assessment, the significance of the effects of construction traffic on accidents and safety would be based on professional judgement and interpretation.

Baseline Conditions

Site Context

- 11.28 The Site boundary is illustrated in Figure 11.1.
- 11.29 The Site is situated north of River Stinchar and east of the 'U25' between Barr and B741 (east of Dailly), approximately 10.5 km east of Girvan and approximately 4 km south of Dailly in South Ayrshire.
- 11.30 The landform of the Site consists predominantly rough grassland cover and extensive areas of plantation forestry. Several small watercourses drain the Site and these flow into either the Water of Girvan or River Stinchar via several burns.
- 11.31 An operational quarry (Tormitchell Quarry) is located south-east of Girvan and it can be accessed via the 'C13' from Old Dailly to the north and Pinmore to the south.

Study Area

- 11.32 The study area that has been used for this assessment, is the public highway network in vicinity of the Site which would be used during the construction and operation of the Proposed Development. For the purposes of assessment, this includes the following roads where DFT traffic count sites are available:
- A77(T).
 - A714.
 - B741.

Site Access

- 11.33 Access to the Proposed Development will be taken from two points of access. The accesses are situated on:
- U25 (Grid Reference: NX 29416, 97714); and
 - U27 (Grid Reference: NX 33114 99629).

Route Options for Abnormal Loads

- 11.34 An Abnormal Indivisible Load (AIL) Assessment has been undertaken by Systra (2020). This document identifies the AIL route from the Port of Ayr to Site and is illustrated in Figure 11.2 in Volume II. AILs transporting turbine equipment use the following route:
- AIL Access: Waggon Road – A79 Allison Street – A77(T) – B734 – B7035 – new track for abnormal loads south of Dailly – 'U25' – Site access.

Route Options for HGVs

- 11.35 It is assumed that HGV wagons for aggregate/general construction phases will utilise construction route(s) from the A77(T). Where possible aggregate for construction activities will be sourced from the on-site borrow pits however, where this is not possible, it is assumed that the local supplier at Tormitchell Quarry will be used.
- 11.36 The HGV haulage routes have been influenced and identified using the Timber Transport Forum's 'Agreed Route Map, knowledge of local roads acquired through site audits and roads used for nearby and neighbouring Wind Farm developments (Hadyard Hill, Carrick, Clauchrie) were used to establish the most appropriate route(s) to the Site. The route identified within the Scoping Report through Maybole and Crosshill via the B7023 will not be used.
- 11.37 Several HGV routes have been included to present a worst-case robust assessment and are identified as follows and illustrated within Figure 11.2:
- HGV Access 1: Tormitchell Quarry – 'C13' – 'C10' – B7035 east – 'U25' – Site access;
 - HGV Access 2: Tormitchell Quarry – 'C13' – 'C10' – B7035 east – B741 east – 'U27' – Site access; and
 - HGV Access 3: Tormitchell Quarry – 'C13' – 'C10' – B7035 west – B734 west – A714 southbound – 'C46w' (via Glentool) – 'U57' – 'U27' – Site access.
- 11.38 A combination of the above routes may be used for general construction traffic subject to the location of material suppliers and aggregate from Tormitchell Quarry.

Local Road Network

A77(M77)

- 11.39 The A77 is a road of strategic national importance connecting Stranraer with Glasgow via Girvan, Ayr and Kilmarnock. This is a single-carriageway road between Stranraer and Ayr, and dual-carriageway between Ayr and Glasgow. This route has been used previously for the transportation of wind turbine components, including AILs. The road, away from settlements and built up areas, is subject to a 60mph speed limit.

A714

- 11.40 The A714 is a two-way single carriageway road which routes between Girvan and Wigtown, via settlements of Pinmore, Barrhill, and Newton Stewart. The section of road within the study area is predominately rural in nature, lined by trees, fields and wide verges. The road is subject to a 60mph speed limit however, this reduces to 20mph in some locations (Barrhill, Pinwherry to name a few). Away from these settlements, there are no pedestrian or cycle facilities however, as the road passes through such settlements, direct frontage is observed with some schools and footways present.

B734

- 11.41 The B734 is a two-way single carriageway road which routes between Girvan and Pinmore via Old Dailly, Penkill and Barr. The section of highway within the study area is predominately rural in nature, lined by trees, fields and wide verges. The road is subject to a 60mph speed limit. There is no provision of pedestrian and cycle facilities within the study area.

B7035

- 11.42 The B7035 is a two-way single carriageway road which routes between Old Dailly and B741 (south-east of Dailly). The section of highway within the study area is predominately rural in nature, lined by trees, fields and wide verges. The road, away from settlements and built up areas, is subject to a 60mph speed limit. The section which runs along the southern boundary of Dailly is subject to a 30mph speed limit (Eldinton Terrace). The western side of this section of the road provides access to residential properties with footway provision. Street lighting is also present in this section of the road with bus stops identified by bus flags and bus shelter (westbound only) provided.

B741

- 11.43 The B741 is a two-way single carriageway road which routes between A77 (Girvan) and A76 (New Cumnock) via Dailly, Straiton and Dalmellington. The section of highway within the study area is predominately rural in nature, lined by trees, fields and wide verges. The road, away from settlements and built up areas, is subject to a 60mph speed limit. There is no provision of pedestrian and cycle facilities within the study area.

Desk Study

- 11.44 The sources of information used for the Traffic and Transportation assessment are listed below in Table 11.6.

Table 11.6 Sources of information used for the Traffic and Transport assessment

Source	Data
Google Earth/Google Maps	Online mapping
Crashmap	Personal Injury Accidents (PIAs)
Department for Transport (DfT)	Traffic Count Data
Timber Transport Forum	Agreed Route Map (Timber traffic)

Survey Work

- 11.45 Due to Covid-19, a decision was made not to survey local roads as results would be atypical due to the general reduction in traffic resulting from Government restrictions and advice (work at home wherever possible for example). As such, it would not be possible to identify a traffic baseline under current circumstances that would be typical of the time period when construction and operation would take place. DfT permanent traffic count sites were therefore used from 2019 (from which a robust baseline and future baseline can be derived) and growth factor applied for the traffic impact assessment.

Personal Injury Accident Data

- 11.46 Records of the personal injury accidents (PIAs) have been obtained from the CrashMap database (<https://www.crashmap.co.uk/>) which uses information collected from the Police. This data is approved by the National Statistics Authority and reported on by the Department for Transport (DfT) each year.
- 11.47 Records have been obtained over a five-year period between January 2015 and December 2019.
- 11.48 The impact of casualties differs according to the severity of the injuries sustained. Three groups are usually differentiated as follows:
- Fatal: any death that occurs within 30 days from causes arising out of an accident;
 - Serious: casualties who require hospital treatment and have lasting injuries, but who do not die within 30 days of an accident; and
 - Slight: where casualties have injuries that do not require hospital treatment, or, if they do, the effects of the injuries quickly subside.
- 11.49 A summary of the PIAs recorded is presented below in Table 11.7 and illustrated in Figure 11.3 in Volume II.

Table 11.7 Summary of recorded PIAs in proximity to the Site

Description	Casualties				
	Slight	Serious	Fatal	Total	Accident rate per annum
A77 (between B734 - Knockushan Street)	2	1	0	3	0.6
A77 (Knockushan Street)	1	0	0	1	0.2
A77 (between Knockushan Street – Shallochpark roundabout A714)	1	0	0	1	0.2
A714 (between A77 – B734 Pinmore)	3	0	0	3	0.6
A714 (between B734 Pinmore – B734 at Pinwherry)	0	1	0	1	0.2
A714 (between B734 at Pinwherry – B7021 Barrhill)	3	1	0	4	0.8
A714 (between B7021 Barrhill – C46w)	0	0	0	0	0
B734 (between Girvan – Old Dailly)	1	0	0	1	0.2
B7035 (between Old Dailly – Dailly)	1	0	0	1	0.2
B741 (Dailly – to U27)	1	0	0	1	0.2
U27 / U57 / c1 / C46w (combined)	3	0	0	3	0.6

11.50 No fatal accidents were recorded within the PIA study area.

Baseline Traffic Flows

11.51 Baseline traffic flow data has been established using publicly available traffic counts published by the Department for Transport (DfT). These counts detail the annual average daily traffic (AADT) (24-hour), and the proportion of HGVs, at appropriate locations on each road within the study area. Figure 11.4 in Volume II indicates the locations of each traffic count and data from 2019 presented in Table 11.8.

11.52 A factor has been applied to this count to reduce the AADT 24-hour flow to a 12-hour traffic flow to coincide with the typical 12-hr working days which are anticipated during the construction phase of the Proposed Development and to make the assessment more robust. The factor (0.806) has been derived from Table TRA0307 'Motor Vehicle Traffic Distribution by time of day and day of the week on all roads, Great Britain: 2019'.

Table 11.8 Baseline traffic flows

		2019 Baseline AADT		2019 baseline 12-hour adjusted	
Road	Location	HGVs	Total Vehicles	HGVs	Total Vehicles
A77	Near Duncan Street, Girvan (74453)	413	5,417	333	4,366
A77	Northwest of Girvan rail station (74454)	578	9,297	466	7,493
A77	North of Drumbain Burn, Dipple (80216)	1,032	8,042	832	6,482
A714	North of Pinmore (1076)	119	1,249	96	1,007
A714	South of Pinwherry (50996)	106	1,082	85	872
A714	South of Barrhill (20887)	105	740	85	596
B741	Approximately 600m east of Cloyntie (930171)	47	625	38	504

Future Baseline Traffic Flows

11.53 Background traffic growth will occur on the local road network irrespective of whether or not the Proposed Development is constructed. Projected baseline traffic growth flows for the expected year of construction (anticipated to be 2024) have been calculated by applying growth factors from the National Trip End Model (NTEM) forecasts. NTEM is designed by the DfT and provides traffic growth forecasts for use in local and regional transportation models.

11.54 A growth factor of 1.03585 was applied to the 2019 base flows to forecast traffic for the year 2024, assumed to be the year of construction. This growth factor was calculated using the Trip End Model Presentation Program (TEMPro), which determines growth factors based

upon the NTEM forecasts. These factors were determined by using the South Ayrshire geographic area.

Table 11.9 Future Baseline traffic flows (2024)

		2019 Baseline 12-hour adjusted		2024 Future baseline 12-hour	
Road	Location	HGVs	Total Vehicles	HGVs	Total Vehicles
A77	Near Duncan Street, Girvan (74453)	333	4,366	345	4,523
A77	Northwest of Girvan rail station (74454)	466	7,493	483	7,762
A77	North of Drumbain Burn, Dipple (80216)	832	6,482	862	6,714
A714	North of Pinmore (1076)	96	1,007	99	1,043
A714	South of Pinwherry (50996)	85	872	88	903
A714	South of Barrhill (20887)	85	596	88	618
B741	Approximately 600m east of Cloyntie (930171)	38	504	39	522

Identification and the Evaluation of Effects

- 11.55 This section provides an assessment of the likely significant environmental effects arising from the traffic predicted to be generated by the Proposed Development.
- 11.56 Table 11.10 identifies the sensitivity of the relevant highway links (in vicinity of the count point and general nature of highway link as a whole) and the GEART Rule that applies.

Table 11.10 Locations sensitive to change in traffic flow

Highway Link	Rationale	Receptor Sensitivity	Assessment (Rule 1/2)
A77 - Near Duncan Street, Girvan (74453)	Sacred Heart Primary School situated nearby. Presence of footways with crossing opportunities such as build outs, refuges and dropped kerbs. Bus stops with shelters. Clear visibility. Residential properties set back from carriageway.	High	Rule 2
A77 - Northwest of Girvan rail station (74454)	Railway station located close by. Presence of footways with crossing opportunities such as build outs, refuges and dropped kerbs. Bus stops with bus flags, no shelter. Clear visibility. Residential properties set back from carriageway.	Medium	Rule 2
A77 - North of Drumbain Burn, Dipple (80216)	No sensitive receptors. Wide rural and open. Clear visibility. No footways. Bus stops with shelters. Sufficiently distant from sensitive land uses.	Low	Rule 1

A714 - North of Pinmore (1076)	No sensitive receptors. Wide rural and open. Clear visibility. No footways. Bus stops with shelters.	Low	Rule 1
A714 - South of Pinwherry (50996)	No sensitive receptors. Wide rural and open. Clear visibility. No footways or bus stops, pedestrian crossings.	Negligible	Rule 1
A714 - South of Barrhill (20887)	No sensitive receptors. Wide rural and open. Clear visibility. No footways or bus stops, pedestrian crossings.	Negligible	Rule 1
B741 - Approximately 600m east of Cloyntie (930171)	No sensitive receptors. Wide rural and open. Clear visibility. No footways or bus stops, pedestrian crossings.	Negligible	Rule 1

Construction Programme

- 11.57 Where possible, construction operations would be carried out concurrently, thus minimising the overall length of the construction programme. An indicative 12-month construction programme (commencing in 2024) has been assumed for the purposes of this assessment.
- 11.58 There are two potential options to consider for the construction of the Proposed Development as follows:
- Scenario 1: 100% of all aggregate sourced from off-site (worst-case scenario); and
 - Scenario 2: aggregate would be won from two on-site borrow pits (approx. 87,000 m³ of aggregate extraction has been identified).
- 11.59 To present a robust assessment, the worst-case scenario (Scenario 1), whereby aggregate would be sourced off-site, has been taken forward for assessment.

Table 11.11 Predicted Traffic Generation during Construction Phase – Aggregate sourced off-site (Scenario 1)

Activity	Total Loads	Total Trips (two-way)
Timber Felling	404	808
Delivery of Plant and Equipment	30	60
Delivery of Stone for Construction Compound	270	540
Delivery of Compound General Equipment	20	40
Delivery of Stone for Access Tracks	2,297	4,594
Delivery of Stone for AIL Track	185	370
Delivery of Geogrid	63	126
Delivery of Culvert Materials	30	60

¹ Technical Appendix 2: Hadyard Hill Extension Wind Farm Environmental Statement

Activity	Total Loads	Total Trips (two-way)
Delivery of Stone for Areas of Crane Operation	1,455	2,910
Delivery of Backfill Stone for Turbines	882	1,764
Delivery of Concrete for Turbines	963	1,926
Concrete for transformer foundations	13	26
Delivery of Base Rings	7	14
Delivery of Shuttering	14	28
Delivery of Form work and reinforcing steel	3	6
Delivery of Stone for substation	130	260
Delivery of Fibre Optic Cabling	4	8
Delivery of Sand for cable trench	104	208
Delivery of Cabling	8	16
Delivery and Removal of Mobile Crane	24	48
Delivery of Turbines	140	280
Delivery of Concrete for Control Building Base	15	30
Delivery of Electrical Equipment	60	120
Delivery of External Transformers	5	10
Delivery of HV Plinth Concrete	45	90
Removal of Plant and Equipment	30	60
Total	7,201	14,402

- 11.60 It should be noted that HGV movements associated with the AIL track (which equate to approximately 370 two-way movements e.g. 185 arrive / 185 depart) are not anticipated to route through Dailly on the (C30) and would instead route up towards Craig Hill via Low Park/Craig.

Table 11.12 Predicted Traffic Generation during Construction Phase – Aggregate sourced from on-site Borrow Pits (Scenario 2)

Activity	Total Loads	Total Trips (two-way)
Timber Felling	404	808

Activity	Total Loads	Total Trips (two-way)
Delivery of Plant and Equipment	30	60
Delivery of Compound General Equipment	20	40
Delivery of Geogrid	63	126
Delivery of Culvert Materials	30	60
Delivery of Concrete for Turbines	963	1,926
Concrete for transformer foundations	13	26
Delivery of Base Rings	7	14
Delivery of Shuttering	14	28
Delivery of Form work and reinforcing steel	3	6
Delivery of Fibre Optic Cabling	4	8
Delivery of Sand for cable trench	104	208
Delivery of Cabling	8	16
Delivery and Removal of Mobile Crane	24	48
Delivery of Turbines	140	280
Delivery of Concrete for Control Building Base	15	30
Delivery of Electrical Equipment	60	120
Delivery of External Transformers	5	10
Delivery of HV Plinth Concrete	45	90
Removal of Plant and Equipment	30	60
Total	1,982	3,964

- 11.61 Scenario 1 results in an approximate peak construction movement of 93 two-way HGVs (approx. 47 arrive, 47 depart) which are predicted to occur during month 4 of the 12-month construction programme.
- 11.62 However, it should be recognised that this is the worst-case scenario, and it is likely that on-site borrow pits will be utilised (Scenario 2) resulting in a total of 3,964 off-site two-way trips. This is 10,438 HGV movements less than Scenario 1. Scenario 2 could equate to a peak construction movement of 28 two-way trips per day.
- 11.63 A construction route would be agreed with SAC as part of a Construction Traffic Management Plan (CTMP) at the detailed design stage. Wherever possible, construction traffic would be scheduled to avoid peak hour travel to ensure minimal disruption.

Assessment of Likely Effects

Construction Effects

- 11.64 Table 11.13 shows the percentage change in traffic flows in 2024, with construction traffic on the local road network for Scenario 1 (aggregate sourced off-site). The GEART screening exercise is also presented within this table. Percentage increases that exceed the relevant GEART threshold of assessment rule would be subject to further assessment. Any increase that is below the GEART threshold would not be taken forward for assessment.

Table 11.13 Forecast Baseline Traffic 2024 with Predicted Construction Traffic

Highway Link	GEART Screening Rule	2024 Base		Constructi on Traffic	2024 + Construction		% change		Further assessment required
		HGVs	Total	HGVs	HGVs	Total	HGVs	Total	
A77 - Near Duncan Street, Girvan (74453)	Rule 2	345	4523	93	438	4,616	27%	2%	Exceeds 10% in HGV traffic only - assessment required
A77 - Northwest of Girvan rail station (74454)	Rule 2	483	7762	93	576	7,855	19%	1%	Exceeds 10% in HGV traffic only - assessment required
A77 - North of Drumbain Burn, Dipple (80216)	Rule 1	862	6714	93	955	6,807	11%	1%	Below 30% - no assessment required
A714 - North of Pinmore (1076)	Rule 1	99	1043	93	192	1,136	94%	8%	Exceeds 30% in HGV traffic only - assessment required
A714 - South of Pinwherry (50996)	Rule 1	88	903	93	181	996	105%	9%	Exceeds 30% in HGV traffic only - assessment required
A714 - South of Barrhill (20887)	Rule 1	88	618	93	181	711	106%	13%	Exceeds 30% in HGV traffic only - assessment required
B741 - Approximately 600m east of Cloyntie (930171)	Rule 1	39	522	93	132	615	237%	15%	Exceeds 30% in HGV traffic only - assessment required

- 11.65 Given the potential receptors described in Table 11.10, Table 11.13 identifies the highway links that are taken forward for assessment based on the percentage impacts on these links exceeding the 10% threshold (Rule 2) or 30% HGV threshold (Rule 1) when considering the worst-case scenario whereby all aggregate is imported to site.
- 11.66 An assessment of environmental effects on:
- A77 - Near Duncan Street, Girvan;
 - A77 - Northwest of Girvan rail station;
 - A714 - North of Pinmore;
 - A714 - South of Pinwherry;
 - A714 - South of Barrhill;
 - B741 - Approximately 600m east of Cloyntie.
- 11.67 It is important to note that the assessment assumes 100% of aggregate will be sourced off-site. Furthermore, the assessment assumes that 100% of HGV traffic routes on each access route (identified earlier in this Chapter), but in reality, traffic would be distributed across a number of access routes (illustrated and described), subject to the final sources of aggregate and a routing agreement with SAC/Ayrshire Roads Alliance. Table 11.13 identifies the worst-case percentage increases.
- 11.68 In reality, traffic effects will be reduced given that all aggregate requirements can be sourced from on-site borrow pits.

Predicted Effects and their Significance: A77 - Near Duncan Street, Girvan

- 11.69 The GEART threshold is exceeded by the increase of HGVs on baseline HGV traffic 17%. The threshold is not exceeded when compared with total traffic.

Severance

- 11.70 Pedestrian footways are present on both sides of the A77 in this location. Dropped kerbs with pedestrian build outs and refuges are provided to aid crossing of the road. A 20mph speed limit is actuated during school pick up/drop off times. Footways, in general, are set back from the carriageway and segregated by on-street parking. Guard railing is present in vicinity of the Sacred Heart Primary School. The carriageway is wide in this location and benefits from good visibility for crossing in either direction.
- 11.71 The highway link has a high receptor sensitivity (Table 11.10) and increases in HGV traffic are between 0-30% resulting in negligible change (Table 11.4), the level of the effect is considered minor / negligible overall and therefore not significant (Table 11.5) in terms of the EIA guideline.
- 11.72 If on-site borrow pits are used on site, and/or variety or off-site quarries utilised during the construction phase, impacts are greatly reduced.

Driver Delay

- 11.73 The highway link has high receptor sensitivity (Table 11.10) and increases in HGV traffic are between 0-30% resulting in negligible change (Table 11.4), the level of the effect is considered minor / negligible overall and therefore not significant (Table 11.5) in terms of the EIA guideline.
- 11.74 If on-site borrow pits are used on site, and/or variety of off-site quarries utilised during the construction phase, impacts are greatly reduced.

Pedestrian Delay and Amenity

- 11.75 Opportunities for pedestrian crossing over the A77 are present throughout Girvan. Footways are generally wide and set back from the carriageway. Pedestrian refuges, buildouts and dropped kerbs are present. Lower speed limits apply through the town.
- 11.76 Although no definitive thresholds are referenced within GEART, it is suggested that a road with no crossings, subject to an hourly flow of 1,400 vehicles per hour would yield a delay of 10 seconds, predicted two-way hourly traffic flows are well below this threshold.

The highway link has high receptor sensitivity (Table 11.10) and increases in HGV traffic are between 0-30% resulting in negligible change (Table 11.4), the level of the effect is considered minor / negligible overall and therefore not significant (Table 11.5) in terms of the EIA guideline.

Fear and Intimidation

- 11.77 Opportunities for pedestrian crossing over the A77 are present throughout Girvan. Footways are generally wide and set back from the carriageway. Pedestrian refuges, buildouts and dropped kerbs are present making for an attractive safer pedestrian environment. Lower speed limits apply through the town.
- 11.78 The highway link has high receptor sensitivity (Table 11.10) and increases in HGV traffic are between 0-30% resulting in negligible change (Table 11.4), the level of the effect is considered minor / negligible overall and therefore not significant (Table 11.5) in terms of the EIA guideline.

Accidents and Safety

- 11.79 Analysis of recorded PIAs at key locations on the local road network showed that no fatalities occurred during the last five years for which data was gathered and, of those PIAs recorded, none were the result of existing highway arrangements or junction design.
- 11.80 There is nothing to suggest that the construction of the Proposed Development would increase the likelihood of accidents and reduce safety. No significant effects in respect of accidents and safety are therefore anticipated.
- 11.81 A summary of the results of the assessment is provided in Table 11.13.

Predicted Effects and their Significance: A77 - Northwest of Girvan rail station

- 11.82 The GEART threshold is exceeded by the increase of HGVs on baseline HGV traffic by 9%. The threshold is not exceeded when compared with total traffic.

Severance

- 11.83 Pedestrian footways are present on both sides of the A77 in this location. Dropped kerbs with pedestrian build outs and refuges are provided to aid crossing of the road. the road is subject to a 30mph speed limit. Footways are segregated by on-street parking. A signalised pedestrian crossing is provided in vicinity of the Asda Supermarket to the west. The carriageway is wide in this location and benefits from good visibility for crossing in either direction.
- 11.84 The highway link has a medium receptor sensitivity (Table 11.10) and increases in HGV traffic are between 0-30% resulting in negligible change (Table 11.4), the level of the effect is considered minor / negligible overall and therefore not significant (Table 11.5) in terms of the EIA guideline.
- 11.85 If on-site borrow pits are used on site, and/or variety or off-site quarries utilised during the construction phase, impacts are greatly reduced.

Driver Delay

- 11.86 The highway link has a medium receptor sensitivity (Table 11.10) and increases in HGV traffic are between 0-30% resulting in negligible change (Table 11.4), the level of the effect is considered minor / negligible overall and therefore not significant (Table 11.5) in terms of the EIA guideline. It should be considered that increases in total traffic do not exceed the Rule 1 threshold of 30%.
- 11.87 If on-site borrow pits are used on site, and/or variety or off-site quarries utilised during the construction phase, impacts are greatly reduced.

Pedestrian Delay and Amenity

- 11.88 Pedestrian footways are present on both sides of the A77 in this location. Dropped kerbs with pedestrian build outs and refuges are provided to aid crossing of the road. The road is subject to a 30mph speed limit. Footways are segregated by on-street parking. A signalised pedestrian crossing is provided in vicinity of the Asda Supermarket to the west.
- 11.89 The highway link has a medium receptor sensitivity (Table 11.10) and increases in HGV traffic are between 0-30% resulting in negligible change (Table 11.4), the level of the effect is considered minor / negligible overall and therefore not significant (Table 11.5) in terms of the EIA guideline.

Fear and Intimidation

- 11.90 Opportunities for pedestrian crossing over the A77 are present throughout Girvan. Footways are generally wide and set back from the carriageway. Pedestrian refuges, buildouts and dropped kerbs are present making for an attractive safer pedestrian environment. Lower speed limits apply through the town.
- 11.91 The highway link has a medium receptor sensitivity (Table 11.10) and increases in HGV traffic are between 0-30% resulting in negligible change (Table 11.4), the level of the effect is considered minor / negligible overall and therefore not significant (Table 11.5) in terms of the EIA guideline.

Accidents and Safety

- 11.92 Analysis of recorded PIAs at key locations on the local road network showed that no fatalities occurred during the last five years for which data was gathered and, of those PIAs recorded, none were the result of existing highway arrangements or junction design.
- 11.93 There is nothing to suggest that the construction of the Proposed Development would increase the likelihood of accidents and reduce safety. No significant effects in respect of accidents and safety are therefore anticipated.

Predicted Effects and their Significance: A714 - North of Pinmore

- 11.94 The GEART threshold is exceeded by the increase of HGVs on baseline HGV traffic by 64%. The threshold is not exceeded when compared with total traffic.

Severance

- 11.95 There are no pedestrian facilities on the A714 north of Pinmore. A bus stop is present on the northbound side of the carriageway near Pinmore where a shelter is provided. A short footway with dropped kerb and tactile paving is present.
- 11.96 The highway link has a low receptor sensitivity (Table 11.10) and increases in HGV traffic are over 91% resulting in substantial change (Table 11.4), the level of the effect is considered moderate overall and therefore significant (Table 11.5) in terms of the EIA guideline.
- 11.97 If on-site borrow pits are used on site, and/or variety or off-site quarries utilised during the construction phase, impacts are greatly reduced. 28 two-way HGVs are anticipated with this scenario. This would equate to a 28% percentage increase in HGV traffic at this location. Given that this is less than the Rule 1 threshold (30%), no further assessment would be required if assessing this scenario.

Driver Delay

- 11.98 The highway link has a low receptor sensitivity (Table 11.10) and increases in HGV traffic are over 91% resulting in substantial change (Table 11.4), the level of the effect is considered moderate overall and therefore significant (Table 11.5) in terms of the EIA

guideline. It should be considered that increases in total traffic do not exceed the Rule 1 threshold of 30%.

- 11.99 If on-site borrow pits are used on site, and/or variety or off-site quarries utilised during the construction phase, impacts are greatly reduced.

Pedestrian Delay and Amenity

- 11.100 There are no pedestrian facilities on the A714 north of Pinmore. A short footway with dropped kerb and tactile paving is present. Street lighting is present.
- 11.101 The highway link has a low receptor sensitivity (Table 11.10) and increases in HGV traffic are over 91% resulting in substantial change (Table 11.4), the level of the effect is considered moderate overall and therefore significant (Table 11.5) in terms of the EIA guideline. It should be considered that increases in total traffic do not exceed the Rule 1 threshold of 30%.

Fear and Intimidation

- 11.102 Existing pedestrian movements across the A714 in this location are low in volume and frequency. A bus shelter is provided for users of the bus services 359 and 362.
- 11.103 The highway link has a low receptor sensitivity (Table 11.10) and increases in HGV traffic are over 91% resulting in substantial change (Table 11.4), the level of the effect is considered moderate overall and therefore significant (Table 11.5) in terms of the EIA guideline. It should be considered that increases in total traffic do not exceed the Rule 1 threshold of 30%.

Accidents and Safety

- 11.104 Analysis of recorded PIAs at key locations on the local road network showed that no fatalities occurred during the last five years for which data was gathered and, of those PIAs recorded, none were the result of existing highway arrangements or junction design.
- 11.105 There is nothing to suggest that the construction of the Proposed Development would increase the likelihood of accidents and reduce safety. No significant effects in respect of accidents and safety are therefore anticipated.

Predicted Effects and their Significance: A714 - South of Pinwherry

- 11.106 The GEART threshold is exceeded by the increase of HGVs on baseline HGV traffic by 75%. The threshold is not exceeded when compared with total traffic.

Severance

- 11.107 There are no pedestrian facilities on the A714 south of Pinwherry in vicinity of the count location. There are no pedestrian desire lines or landuses which would result in pedestrians crossing the A714 in vicinity of the count site.

- 11.108 The highway link has a negligible receptor sensitivity (Table 11.10) and increases in HGV traffic are over 91% resulting in substantial change (Table 11.4), the level of the effect is considered minor / negligible overall and therefore not significant (Table 11.5) in terms of the EIA guideline.

Driver Delay

- 11.109 The highway link has a negligible receptor sensitivity (Table 11.10) and increases in HGV traffic are over 91% resulting in substantial change (Table 11.4), the level of the effect is considered minor / negligible overall and therefore not significant (Table 11.5) in terms of the EIA guideline.
- 11.110 If on-site borrow pits are used on site, and/or variety or off-site quarries utilised during the construction phase, impacts are greatly reduced.

Pedestrian Delay and Amenity

- 11.111 There are no pedestrian desire lines or landuses which would result in pedestrians crossing the A714 in vicinity of the count site.
- 11.112 The highway link has a negligible receptor sensitivity (Table 11.10) and increases in HGV traffic are over 91% resulting in substantial change (Table 11.4), the level of the effect is considered minor / negligible overall and therefore not significant (Table 11.5) in terms of the EIA guideline.

Fear and Intimidation

- 11.113 There are no pedestrian facilities, desire lines or landuses which would result in pedestrians crossing the A714 in vicinity of the count site.
- 11.114 The highway link has a negligible receptor sensitivity (Table 11.10) and increases in HGV traffic are over 91% resulting in substantial change (Table 11.4), the level of the effect is considered minor / negligible overall and therefore not significant (Table 11.5) in terms of the EIA guideline.

Accidents and Safety

- 11.115 Analysis of recorded PIAs at key locations on the local road network showed that no fatalities occurred during the last five years for which data was gathered and, of those PIAs recorded, none were the result of existing highway arrangements or junction design.
- 11.116 There is nothing to suggest that the construction of the Proposed Development would increase the likelihood of accidents and reduce safety. No significant effects in respect of accidents and safety are therefore anticipated.

Predicted Effects and their Significance: A714 - South of Barhill

- 11.117 The GEART threshold is exceeded by the increase of HGVs on baseline HGV traffic by 76%. The threshold is not exceeded when compared with total traffic.

Severance

- 11.118 There are no pedestrian facilities on the A714 south of Barrhill in vicinity of the count location. There are no pedestrian desire lines or landuses which would result in pedestrians crossing the A714 in vicinity of the count site.
- 11.119 The highway link has a negligible receptor sensitivity (Table 11.10) and increases in HGV traffic are over 91% resulting in substantial change (Table 11.4), the level of the effect is considered minor / negligible overall and therefore not significant (Table 11.5) in terms of the EIA guideline.

Driver Delay

- 11.120 The highway link has a negligible receptor sensitivity (Table 11.10) and increases in HGV traffic are over 91% resulting in substantial change (Table 11.4), the level of the effect is considered minor / negligible overall and therefore not significant (Table 11.5) in terms of the EIA guideline.
- 11.121 If on-site borrow pits are used on site, and/or variety of off-site quarries utilised during the construction phase, impacts are greatly reduced.

Pedestrian Delay and Amenity

- 11.122 There are no pedestrian desire lines or landuses which would result in pedestrians crossing the A714 in vicinity of the count site.
- 11.123 The highway link has a negligible receptor sensitivity (Table 11.10) and increases in HGV traffic are over 91% resulting in substantial change (Table 11.4), the level of the effect is considered minor / negligible overall and therefore not significant (Table 11.5) in terms of the EIA guideline.

Fear and Intimidation

- 11.124 There are no pedestrian facilities, desire lines or landuses which would result in pedestrians crossing the A714 in vicinity of the count site.
- 11.125 The highway link has a negligible receptor sensitivity (Table 11.10) and increases in HGV traffic are over 91% resulting in substantial change (Table 11.4), the level of the effect is considered minor / negligible overall and therefore not significant (Table 11.5) in terms of the EIA guideline.

Accidents and Safety

- 11.126 Analysis of recorded PIAs at key locations on the local road network showed that no fatalities occurred during the last five years for which data was gathered and, of those PIAs recorded, none were the result of existing highway arrangements or junction design.
- 11.127 There is nothing to suggest that the construction of the Proposed Development would increase the likelihood of accidents and reduce safety. No significant effects in respect of accidents and safety are therefore anticipated.

Predicted Effects and their Significance: B741 - Approximately 600m east of Cloyntie

- 11.128 The GEART threshold is exceeded by the increase of HGVs on baseline HGV traffic by 207%. This percentage increase should be treated with some caution given the low volume of existing baseline HGV flows creates a disproportionate impact. The threshold is not exceeded when compared with total traffic.

Severance

- 11.129 There are no pedestrian facilities on the B741 near Cloyntie in vicinity of the count location. There are no pedestrian desire lines or landuses which would result in pedestrians crossing the B741 in vicinity of the count site.
- 11.130 The highway link has a negligible receptor sensitivity (Table 11.10) and increases in HGV traffic are over 91% resulting in substantial change (Table 11.4), the level of the effect is considered minor / negligible overall and therefore not significant (Table 11.5) in terms of the EIA guideline.

Driver Delay

- 11.131 The highway link has a negligible receptor sensitivity (Table 11.10) and increases in HGV traffic are over 91% resulting in substantial change (Table 11.4), the level of the effect is considered minor / negligible overall and therefore not significant (Table 11.5) in terms of the EIA guideline.
- 11.132 If on-site borrow pits are used on Site, and/or variety or off-site quarries utilised during the construction phase, impacts are greatly reduced.

Pedestrian Delay and Amenities

- 11.133 There are no pedestrian desire lines or landuses which would result in pedestrians crossing the B741 in vicinity of the count site.
- 11.134 The highway link has a negligible receptor sensitivity (Table 11.10) and increases in HGV traffic are over 91% resulting in substantial change (Table 11.4), the level of the effect is considered minor / negligible overall and therefore not significant (Table 11.5) in terms of the EIA guideline.

Fear and Intimidation

- 11.135 There are no pedestrian facilities, desire lines or landuses which would result in pedestrians crossing the B741 in vicinity of the count site.
- 11.136 The highway link has a negligible receptor sensitivity (Table 11.10) and increases in HGV traffic are over 91% resulting in substantial change (Table 11.4), the level of the effect is considered minor / negligible overall and therefore not significant (Table 11.5) in terms of the EIA guideline.

Accidents and Safety

- 11.137 Analysis of recorded PIAs at key locations on the local road network showed that no fatalities occurred during the last five years for which data was gathered and, of those PIAs recorded, none were the result of existing highway arrangements or junction design.
- 11.138 There is nothing to suggest that the construction of the Proposed Development would increase the likelihood of accidents and reduce safety. No significant effects in respect of accidents and safety are therefore anticipated.
- 11.139 A summary of the results of the assessment is provided in Table 11.14.

Operational Effects

- 11.140 The Proposed Development will operate autonomously and will only be visited for inspection or should a fault occur. Given that the former is anticipated to occur on a monthly basis and the latter infrequently (if at all) receptors will not be affected during the operational period and are therefore scoped out of further assessment.

Decommissioning Effects

- 11.141 The effects during the decommissioning of the Proposed Development have not been considered in detail given the unknown conditions of the highway following the 35 year life cycle of the Proposed Development. Furthermore fewer traffic movements will be generated during decommissioning than during construction as below ground infrastructure and access tracks will remain in situ and therefore the magnitude of any change is likely to be less than during construction, particularly against a background of increasing baseline traffic flows in the future. Decommissioning effects are therefore scoped out of further assessment. However, a separate assessment of effects could be conducted nearer time should there be any concerns in respect of decommissioning.

Table 11.14 Summary of significance of adverse effects

Receptor and Summary of Predicted effects		Sensitivity	Significance	Summary Rationale
A77 – Near Duncan Street, Girvan				
Severance	The separation of people from places and other people	High	Not significant	Pedestrian footways are present on both sides of the A77 in this location. Dropped kerbs with pedestrian build outs and refuges are provided to aid crossing of the road. The highway link has a high receptor sensitivity and increases in HGV traffic are between 0-30% resulting in negligible change, the level of the effect is considered minor / negligible overall and therefore not significant.
Driver Delay	Traffic delays as a result of construction traffic	High	Not significant	The highway link has a high receptor sensitivity and increases in HGV traffic are between 0-30% resulting in negligible change, the level of the effect is considered minor / negligible overall and therefore not significant.
Pedestrian Delay & Amenity	The ability to people to cross roads and the effect on the relative pleasantness of a pedestrian journey	High	Not significant	Opportunities for pedestrian crossing over the A77 are present throughout Girvan. Footways are generally wide and set back from the carriageway. Pedestrian refuges, buildouts and dropped kerbs are present. Lower speed limits apply through the town. The highway link has a high receptor sensitivity and increases in HGV traffic are between 0-30% resulting in negligible change, the level of the effect is considered minor / negligible overall and therefore not significant.
Fear and Intimidation	The levels experienced by pedestrians, its proximity to people or the lack of protection caused by such factors as narrow pavement widths	High	Not significant	Opportunities for pedestrian crossing over the A77 are present throughout Girvan. Footways are generally wide and set back from the carriageway. Pedestrian refuges, buildouts and dropped kerbs are present. Lower speed limits apply through the town. The highway link has a high receptor sensitivity and increases in HGV traffic are between 0-30% resulting in negligible change, the level of the effect is considered minor / negligible overall and therefore not significant.
Accidents and Safety	The risk of accidents occurring where development is expected to produce a change in the character of traffic	High	Not significant	Changes in traffic flows would not elevate the risk of accident and safety issues occurring on the local road network.

Receptor and Summary of Predicted effects		Sensitivity	Significance	Summary Rationale
A77 – Northwest of Girvan Rail station				
Severance	As above	Medium	Not significant	Pedestrian footways are present on both sides of the A77 in this location. Dropped kerbs with pedestrian build outs and refuges are provided to aid crossing of the road. The highway link has a medium receptor sensitivity and increases in HGV traffic are between 0-30% resulting in negligible change, the level of the effect is considered minor / negligible overall and therefore not significant in terms of the EIA guideline.
Driver Delay	As above	Medium	Not significant	The highway link has a medium receptor sensitivity and increases in HGV traffic are between 0-30% resulting in negligible change, the level of the effect is considered minor / negligible overall and therefore not significant in terms of the EIA guideline.
Pedestrian Delay & Amenity	As above	Medium	Not significant	Pedestrian footways are present on both sides of the A77 in this location. Dropped kerbs with pedestrian build outs and refuges are provided to aid crossing of the road. The highway link has a medium receptor sensitivity and increases in HGV traffic are between 0-30% resulting in negligible change, the level of the effect is considered minor / negligible overall and therefore not significant in terms of the EIA guideline.
Fear and Intimidation	As above	Medium	Not significant	Opportunities for pedestrian crossing over the A77 are present throughout Girvan. Footways are generally wide and set back from the carriageway. Pedestrian refuges, buildouts and dropped kerbs are present making for an attractive safer pedestrian environment. The highway link has a medium receptor sensitivity and increases in HGV traffic are between 0-30% resulting in negligible change, the level of the effect is considered minor / negligible overall and therefore not significant in terms of the EIA guideline.

Receptor and Summary of Predicted effects		Sensitivity	Significance	Summary Rationale
Accidents and Safety	As above	Medium	Not significant	Changes in traffic flows would not elevate the risk of accident and safety issues occurring on the local road network.
A714 – North of Pinmore				
Severance	As above	Low	Significant	There are no pedestrian facilities on the A714 north of Pinmore. A bus stop is present on the northbound side of the carriageway near Pinmore where a shelter is provided. A short footway with dropped kerb and tactile paving is present. The highway link has a low receptor sensitivity and increases in HGV traffic are over 91% resulting in substantial change, the level of the effect is considered moderate overall and therefore significant in terms of the EIA guideline.
Driver Delay	As above	Low	Significant	The highway link has a low receptor sensitivity and increases in HGV traffic are over 91% resulting in substantial change, the level of the effect is considered moderate overall and therefore significant in terms of the EIA guideline.
Pedestrian Delay & Amenity	As above	Low	Significant	There are no pedestrian facilities on the A714 north of Pinmore. A short footway with dropped kerb and tactile paving is present. Street lighting is present. The highway link has a low receptor sensitivity and increases in HGV traffic are over 91% resulting in substantial change, the level of the effect is considered moderate overall and therefore significant in terms of the EIA guideline.
Fear and Intimidation	As above	Low	Significant	Existing pedestrian movements across the A714 in this location are low in volume and frequency. A bus shelter is provided for users of the bus services 359 and 362. The highway link has a low receptor sensitivity and increases in HGV traffic are over 91% resulting in substantial change, the level of the effect is considered moderate overall and therefore significant in terms of the EIA guideline.
Accidents and Safety	As above	Low	Not significant	Changes in traffic flows would not elevate the risk of accident and safety issues occurring on the local road network.
A714 – South of Pinwherry				

Receptor and Summary of Predicted effects		Sensitivity	Significance	Summary Rationale
Severance	As above	Negligible	Not significant	There are no pedestrian facilities on the A714 south of Pinwherry in vicinity of the count location. There are no pedestrian desire lines or landuses which would result in pedestrians crossing the A714 in vicinity of the count site. The highway link has a negligible receptor sensitivity and increases in HGV traffic are over 91% resulting in substantial change, the level of the effect is considered minor / negligible overall and therefore not significant in terms of the EIA guideline.
Driver Delay	As above	Negligible	Not significant	The highway link has a negligible receptor sensitivity and increases in HGV traffic are over 91% resulting in substantial change, the level of the effect is considered minor / negligible overall and therefore not significant in terms of the EIA guideline.
Pedestrian Delay & Amenity	As above	Negligible	Not significant	There are no pedestrian desire lines or landuses which would result in pedestrians crossing the A714 in vicinity of the count site. The highway link has a negligible receptor sensitivity and increases in HGV traffic are over 91% resulting in substantial change, the level of the effect is considered minor / negligible overall and therefore not significant in terms of the EIA guideline.
Fear and Intimidation	As above	Negligible	Not significant	There are no pedestrian facilities, desire lines or landuses which would result in pedestrians crossing the A714 in vicinity of the count site. The highway link has a negligible receptor sensitivity and increases in HGV traffic are over 91% resulting in substantial change, the level of the effect is considered minor / negligible overall and therefore not significant in terms of the EIA guideline.
Accidents and Safety	As above	Negligible	Not significant	Changes in traffic flows would not elevate the risk of accident and safety issues occurring on the local road network.
A741 – south of Barhill				

Receptor and Summary of Predicted effects		Sensitivity	Significance	Summary Rationale
Severance	As above	Negligible	Not significant	There are no pedestrian facilities on the A714 south of Barhill in vicinity of the count location. There are no pedestrian desire lines or landuses which would result in pedestrians crossing the A714 in vicinity of the count site. The highway link has a negligible receptor sensitivity and increases in HGV traffic are over 91% resulting in substantial change, the level of the effect is considered minor / negligible overall and therefore not significant in terms of the EIA guideline.
Driver Delay	As above	Negligible	Not significant	The highway link has a negligible receptor sensitivity and increases in HGV traffic are over 91% resulting in substantial change, the level of the effect is considered minor / negligible overall and therefore not significant in terms of the EIA guideline.
Pedestrian Delay & Amenity	As above	Negligible	Not significant	There are no pedestrian desire lines or landuses which would result in pedestrians crossing the A714 in vicinity of the count site. The highway link has a negligible receptor sensitivity and increases in HGV traffic are over 91% resulting in substantial change, the level of the effect is considered minor / negligible overall and therefore not significant in terms of the EIA guideline.
Fear and Intimidation	As above	Negligible	Not significant	There are no pedestrian facilities, desire lines or landuses which would result in pedestrians crossing the A714 in vicinity of the count site. The highway link has a negligible receptor sensitivity and increases in HGV traffic are over 91% resulting in substantial change, the level of the effect is considered minor / negligible overall and therefore not significant in terms of the EIA guideline.
Accidents and Safety	As above	Negligible	Not significant	Changes in traffic flows would not elevate the risk of accident and safety issues occurring on the local road network.
B741 – near Cloyntie				

Receptor and Summary of Predicted effects		Sensitivity	Significance	Summary Rationale
Severance	As above	Negligible	Not significant	There are no pedestrian facilities on the B741 near Cloyntie in vicinity of the count location. There are no pedestrian desire lines or landuses which would result in pedestrians crossing the B741 in vicinity of the count site. The highway link has a negligible receptor sensitivity and increases in HGV traffic are over 91% resulting in substantial change, the level of the effect is considered minor / negligible overall and therefore not significant in terms of the EIA guideline.
Driver Delay	As above	Negligible	Not significant	The highway link has a negligible receptor sensitivity and increases in HGV traffic are over 91% resulting in substantial change, the level of the effect is considered minor / negligible overall and therefore not significant in terms of the EIA guideline.
Pedestrian Delay & Amenity	As above	Negligible	Not significant	There are no pedestrian desire lines or landuses which would result in pedestrians crossing the B741 in vicinity of the count site. The highway link has a negligible receptor sensitivity and increases in HGV traffic are over 91% resulting in substantial change, the level of the effect is considered minor / negligible overall and therefore not significant in terms of the EIA guideline.
Fear and Intimidation	As above	Negligible	Not significant	There are no pedestrian facilities, desire lines or landuses which would result in pedestrians crossing the B741 in vicinity of the count site. The highway link has a negligible receptor sensitivity and increases in HGV traffic are over 91% resulting in substantial change, the level of the effect is considered minor / negligible overall and therefore not significant in terms of the EIA guideline.
Accidents and Safety	As above	Negligible	Not significant	Changes in traffic flows would not elevate the risk of accident and safety issues occurring on the local road network.

Cumulative Effects

- 11.142 Consideration has been given as to whether any of the receptors that have been taken forward for assessment in this chapter are likely to be subject to cumulative effects because of the Traffic and Transport effects generated by other developments.
- 11.143 A review of online planning application maps shows that there are six consented wind farm developments within a 20 km search area of the Proposed Development. These are:
- Benbrack;
 - Kirk Hill;
 - Knockshinnoch;
 - South Kyle;
 - Polquahairn; and
 - Overhill.
- 11.144 The above consented schemes are situated approximately within 20 km of the Site. Benbrack, Knockshinnoch, South Kyle, Polquahairn, Overhill are located to the north east of the Site and will not share the same HGV local haul routes as the Proposed Development. Kirk Hill Wind Farm is proposed to be accessed from the A77(T) via Knoxhill Road (U44) near Kirkoswald to the north of Dailly. As above, this development will not share the same local HGV routes as the Proposed Development therefore, no cumulative effects associated with these schemes is likely.
- 11.145 A review of online planning application maps shows that there are three wind farm developments in the planning/application stage within a 20 km search area of the Proposed Development. These are:
- Clauchrie;
 - North Kyle;
 - Overhill (2020); and
 - Carrick
- 11.146 The above application schemes are situated approximately between 20 km to the north and south of the Site. North Kyle and Overhill (2020) are located to the north of the Site and will not share the same HGV local haul routes as the Proposed Development. Therefore, no cumulative effects associated with these two schemes is likely.
- 11.147 Clauchrie is located to the south west of the Proposed Development. It is anticipated that the A714 will be used (from the south via Newton Stewart) as an HGV haul route for this scheme. Carrick is located to the south east of the Proposed Development. The A714 is one of several roads to be identified for use for construction traffic (also B741, B7023, B7045) however, the Carrick Wind Farm Scoping Report has identified that *"it is proposed that on-site borrow pits will be used for the winning of stone..."*. A CTMP is also proposed for Carrick Wind Farm. As evidenced in this Chapter, few or no relevant receptors are identified on this road. Any overlapping activities resulting in additional HGVs would be unlikely to result in significant effects.

11.148 Furthermore, the development of a CTMP for each scheme is anticipated to reduce any cumulative effects experienced on the road network. Should borrow pits be utilised as a source of aggregate at these application sites, this would minimise cumulative effects further.

11.149 On this basis, it is considered that significant cumulative effects are unlikely.

Mitigation Measures

11.150 The CTMP would be agreed in consultation with SAC and developed recognising the need to manage and reduce the traffic impact as part of the Proposed Development. The following section describes the potential effects and the rationale for incorporating mitigation into the Proposed Development to help avoid effects occurring, or to reduce the magnitude of any changes associated with it. The following measures would be incorporated via an CTMP to manage the daily delivery profiles and control movements and routing of HGVs:

- Upon commencement, all deliveries, operatives and visitors to the Site will report to the security gate. This will be communicated to all early works contractors at their pre-start meeting.
- The main contractor will develop a logistics plan highlighting the access point for the project, loading bay, pedestrian / vehicular segregation, welfare, storage, security and material handling that would be enforced following full site establishment.
- Approved haul routes to the Site will be identified and protocols put in place to ensure that HGVs adhere to these routes and do not pass through areas to be avoided such as Dailly.
- All contractors will be provided with a Site induction pack containing information on delivery routes and restrictions on routing.
- Construction traffic will be restricted between the network peak hours and school run hours which are generally 08:00 – 09:00, 15:00 – 16:00 and 17:00 – 18:00 Monday to Friday if necessary.
- Temporary signage will be erected along the identified construction routes to warn people of construction activities and associated construction vehicles.
- Forestry felling will be undertaken as localised 'keyhole' felling. Timber will be stockpiled on-site and transported off-site during quieter months of the programme.
- An integral part of the progress meetings held with all trade contractors is the delivery schedule pro-forma. All contractors will be required to give details of proposed timing of material deliveries to the Site.
- A CTMP and compliance monitoring therein will be included within all trade contractor tender enquiries to ensure early understanding and acceptance/compliance with the rules that would be enforced on this project.
- HGVs will not be allowed to lay-up in surrounding roads. All personnel in the team will be in contact with each other and Site management, who in turn, will have a mobile and telephone contact with sub-contractors.
- Roads will be maintained, and road sweeper deployed as required.

- A wheel wash facility will be installed on-site during the construction period in order to reduce mud and debris being deposited onto the local road network.

11.151 A Staff Travel Plan, would be deployed where necessary, to manage the arrival and departure profile of staff and encourage sustainable modes of transport, especially car-sharing. A package of measures could include:

- Appointment of a Travel Plan Coordinator (TPC);
- Provision of public transport information;
- Mini-bus service for transport of Site staff;
- Promotion of a car sharing scheme; and
- Car parking management.

11.152 The linear nature of the Proposed Development will allow for an even distribution of activities and associated daily HGV demands.

11.153 An AIL Study has been undertaken and is presented in Appendix 11.1 which identifies the mitigation requirements required at each pinch point location.

Residual Impacts

11.154 Residual impacts are summarised in Table 11.15.

Table 11.15 Summary of residual impacts

Receptor and Summary of Predicted effects	Significance	Mitigation Measures	Residual Impacts
A714 – North of Pinmore			
Severance	Significant	CTMP - Temporary signage / route signage	Not significant (Negligible)
Driver Delay	Significant	CTMP – Traffic timing strategy / temporary traffic management / Staff Travel Plan	Not significant (Negligible)
Pedestrian Delay & Amenity	Significant	CTMP - Temporary signage / route signage	Not significant (Negligible)
Fear and Intimidation	Significant	CTMP - Temporary signage / route signage	Not significant (Negligible)
Accidents and Safety	Not significant	None required	Not significant (Negligible)

Summary

- 11.155 An assessment of the traffic levels that would be generated during the construction, operation and decommissioning phases of the Proposed Development has been carried out, with the construction phase being the main focus as this is when most traffic will be generated. Consideration has been given to both Heavy Goods Vehicle (HGV) and abnormal load movements (primarily for the delivery of large turbine components such as blades).
- 11.156 Estimates of traffic generation associated with the construction phase of the Proposed Development have been derived from a first principles approach based on calculations of vehicle loads of imported materials. To assess a worst case, it has been assumed in the assessment that the bulk construction materials (stone aggregate and the materials required for the mixing of concrete) will be sourced from off-site quarries. It is however likely, based on the results of a Borrow Pit Feasibility Assessment², that a reasonable quantity of aggregate can be sourced on-site and therefore impacts would be greatly reduced from those assessed and presented.
- 11.157 It is assumed that HGV wagons for aggregate/general construction phases could utilise the A77(T). Where possible aggregate for construction activities will be sourced from the on-site borrow pits. A number of general HGV route options have been included to present a worst-case robust assessment and are identified as follows:
- HGV Access: Tormitchell Quarry – 'C13' – 'C10' – B7035 east – 'U25' – Site access;
 - HGV Access: Tormitchell Quarry – 'C13' – 'C10' – B7035 east – B741 east – 'U27' – Site access; and
 - HGV Access: Tormitchell Quarry – 'C13' – 'C10' – B7035 west – B734 west – A714 southbound – 'C46w' (via Glentroll) – 'U57' – 'U27' – Site access.
- 11.158 All turbine components will be imported into Scotland via the Port of Ayr and delivered to the Site by road. Abnormal Indivisible Loads (AIL) transporting turbine equipment will arrive at the Port of Ayr where they will travel to the Site via the following route:
- AIL Access: Waggon Road – A79 Allison Street – A77(T) – B734 – B7035 – new abnormal load track at Dailly (off-site access track) – 'U25' – Site access.
- 11.159 The impact of construction-related traffic on the proposed access routes for road stone deliveries, in percentage terms, relative to the future predicted baseline, which was calculated using the 2024 background traffic levels. The current proportions of HGVs on the local highway network are generally low and therefore do result in disproportionate comparisons.
- 11.160 This assessment has concluded that based on 100% of import of all aggregate required for the construction phase of the Proposed Development that this would result in a peak of 93 two-way HGVs (approx. 47 arrive, 47 depart) which are predicted to occur during

² Technical Appendix 2: Hadyard Hill Extension Wind Farm Environmental Statement

months 4 of the 12-month construction programme across an 11 hour working day (Mon-Fri 0700-1800).

- 11.161 If on-site borrow pits are utilised this would result in a total of 3,964 off-site two-way trips. This is 10,438 HGV movements less than with the importation of aggregate. Using borrow pits would equate to a peak construction movement of 28 two-way trips per day.
- 11.162 An assessment of environmental effects based on the percentage impact results was undertaken on the following roads:
- A77 – near Duncan Street, Girvan,
 - A77 – northwest of Girvan rail station;
 - A77 – north of Drumbain Burn, Dipple;
 - A714 – north of Pinmore;
 - A714 – South of Pinwherry;
 - A714 – south of Barrhill; and
 - B741 – near Cloyntie.
- 11.163 Six (out of seven) local roads which may be used by construction traffic were taken forward for assessment of effects following the IEMA 10% threshold (Rule 2) or 30% HGV threshold (Rule 1) thresholds when considering the worst-case scenario whereby all aggregate is imported to Site.
- 11.164 It has been determined that as the A714 – North of Pinmore has a low receptor sensitivity, this results in a substantial magnitude of change, the level of the effect is considered moderate overall and therefore significant in terms of the EIA guideline. It should be considered that increases in total traffic do not exceed the Rule 1 threshold of 30%. Given that on-site borrow pits are likely to be used, impacts will be greatly reduced resulting in a total of 3,964 off-site two-way trips (10,438 HGV movements less than Scenario 1).
- 11.165 With mitigation measures in place, it can be concluded that there are no residual impacts. The impact is not significant.
- 11.166 As summarised in Table 11.15, construction traffic associated with the Proposed Development would result in no significant effects in terms of severance, driver delay, pedestrian delay and amenity, fear and intimidation, or accidents and safety with the inclusion of mitigation measures.
- 11.167 The overall impact was considered not significant in terms of the EIA Regulations.

References

- Department for Transport (DfT) (2009), Traffic Signs Manual: Chapter 8, Traffic Safety Measures and Signs for Road Works and Temporary Situations.
- Institute of Environmental Assessment (1993), Guidelines for the Environmental Assessment of Road Traffic (GEART), Institute of Environmental Assessment.

Abbreviations

- AIL- Abnormal Indivisible Load - Any load that cannot be broken down into smaller loads for transport without undue expense or risk of damage.
- CTMP - Construction Traffic Management Plan - The main objective of a CTMP is to minimise the impact of works traffic on the road network and increase the safety of workers and road users.
- GEART - Guidelines for the Environmental Assessment of Road Traffic, Institute of Environmental Assessment (1993).
- HGV - Heavy Goods Vehicle - Goods vehicles over 3.5 tonnes maximum permissible gross vehicle weight (includes OGV1, OGV2 and PSV classes).
- MPH - Miles Per Hour - Imperial customary unit for speed expressing the number of statute miles covered in one hour.
- PIA - Personal Injury Accident - Road traffic accidents where slight, serious or fatal injuries to people have been recorded. The data will generally include such information as the location of an accident, number of casualties, the modes of travel involved, age and gender of those involved, and the contributing factors to the accident.
- SPA - Swept Path Analysis - Simulates the turning movements of vehicles using specialist software to understand the impact to the public highway.
- TA - Transport Assessment - Transport Assessments are thorough assessments of the transport implications of a development which is likely to have significant transport and related environmental impacts.
- TEMPro - Trip End Model Presentation Program - This software allows users to view travel forecasts from the National Trip End Model (NTEM) datasets to obtain growth factors.